

## CLAIMS

What is claimed is:

1. A method of tracking mobile station power headroom at a wireless communication network base station comprising:
  - receiving a power headroom report from a mobile station;
  - storing a headroom value for the mobile station based on the power headroom report received from the mobile station; and
  - updating the headroom value to track changes in a transmit power of the mobile station based on reverse link power control information associated with the mobile station.
2. The method of claim 1, wherein receiving a power headroom report from a mobile station comprises receiving periodic power headroom reports from the mobile station.
3. The method of claim 2, wherein storing a headroom value for the mobile station based on the power headroom report received from the mobile station comprises setting the stored headroom value to a received headroom value in each periodic power headroom report.
4. The method of claim 1, wherein updating the headroom value to track changes in a transmit power of the mobile station based on reverse link power control information associated with the mobile station comprises incrementing and decrementing the headroom value based on reverse link power control commands being transmitted to the mobile station.

5. The method of claim 4, further comprising transmitting reverse link power control commands to the mobile station at a defined rate, and wherein incrementing and decrementing the headroom value based on reverse link power control commands being transmitted to the mobile station comprises:

decrementing the headroom value responsive to transmitting an up power command to the mobile station; and  
incrementing the headroom value responsive to transmitting a down power command.


6. The method of claim 1, wherein updating the headroom value to track changes in a transmit power of the mobile station based on reverse link power control information associated with the mobile station comprises receiving power adjustment feedback from the mobile station indicative of its ongoing reverse link transmit power adjustments, and updating the headroom value based on the power adjustment feedback.

7. The method of claim 6, wherein receiving power adjustment feedback from the mobile station comprises receiving power control decisions from the mobile station that indicate whether the mobile station increased or decreased its transmit power in a given power control interval.

8. The method of claim 1, further comprising determining whether to grant an increased reverse link data rate to the mobile station based on the headroom value.

9. The method of claim 1, further comprising determining whether to select the mobile station for a reverse link rate adjustment based on the headroom value.

10. The method of claim 1, wherein the mobile station comprises one in a plurality of mobile stations being supported by the base station, and further comprising receiving power headroom reports from the plurality of mobile stations, storing headroom values for the plurality of mobile stations, and updating the headroom value for each mobile station based on reverse link power control information associated with each mobile station.

11. A method of tracking mobile station power headroom at a wireless communication network base station comprising: 
- periodically receiving a full report from a mobile station that indicates a transmit power headroom of the mobile station;
- updating a headroom value maintained at the base station for the mobile station responsive to receiving each full report; and
- tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station.
12. The method of claim 11, wherein periodically receiving a full report from a mobile station that indicates a transmit power headroom of the mobile station comprises periodically receiving one or more bits in a Packet Data Unit (PDU) header.
13. The method of claim 12, wherein periodically receiving a full report from a mobile station that indicates a transmit power headroom of the mobile station comprises receiving a full report from the mobile station every  $N$  reverse link transmit frames, where  $N$  is an integer number greater than zero.
14. The method of claim 11, wherein tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station comprises receiving one or more differential reports from the mobile station during intervals between the full reports.
15. The method of claim 11, wherein tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station comprises receiving one or more bits at each reverse link power control

decision point indicating whether the mobile station incrementally increased or decreased its reverse link transmit power at that decision point.

16. The method of claim 15, wherein tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station further comprises incrementally adjusting the headroom value up or down according to the differential reports being received from the mobile station.

17. The method of claim 11, further comprising determining whether to select the mobile station for a reverse link rate increase based on whether the headroom value maintained at the base station for the mobile station indicates that the mobile station has sufficient transmit power headroom to support a contemplated higher rate.

18. The method of claim 11, wherein tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station comprising incrementally adjusting the headroom value for the mobile station based on reverse link power control commands being transmitted to the mobile station.

19. The method of claim 11, wherein tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station comprises receiving one or more differential reports from the mobile station between the full reports, wherein the differential reports indicate incremental adjustments in transmit power being made by the mobile station responsive to reverse link power control commands received by the mobile station.

20. The method of claim 19, wherein the mobile station comprises one in a plurality of mobile stations, and further comprising maintaining headroom values for the plurality of mobile stations responsive to receiving full and differential reports from each mobile station.

21. The method of claim 20, further comprising using the headroom values maintained for the plurality of mobile stations to determine whether particular ones of the mobile stations are candidates for reverse link rate increases.

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22. A base station for use in a wireless communication network comprising:
- transceiver circuits to communicate with a plurality of mobile stations via wireless signaling; and
- one or more processing circuits to control communications with the plurality of mobile stations;
- said one or more processing circuits including a headroom tracking circuit configured to track transmit power headroom for a mobile station by:
- periodically receiving a full report from the mobile station that indicates a transmit power headroom of the mobile station;
- updating a headroom value maintained at the base station for the mobile station responsive to receiving each full report; and
- tracking changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station.
23. The base station of claim 22, wherein the headroom tracking circuit is configured to periodically receive one or more bits in a Packet Data Unit (PDU) header as the full report.
24. The base station of claim 23, wherein the headroom tracking circuit is configured to receive a full report from the mobile station every N reverse link transmit frames, where N is an integer number greater than zero.

25. The base station of claim 22, wherein the headroom tracking circuit is configured to track changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station by receiving one or more differential reports from the mobile station during intervals between the full reports.

26. The base station of claim 22, wherein the headroom tracking circuit is configured to track changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station by receiving one or more bits at each reverse link power control decision point indicating whether the mobile station incrementally increased or decreased its reverse link transmit power at that decision point.

27. The base station of claim 26, wherein the headroom tracking circuit is configured to track changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station further by incrementally adjusting the headroom value up or down according to the differential reports being received from the mobile station.

28. The base station of claim 22, wherein the base station is configured to determine whether to select the mobile station for a reverse link rate increase based on whether the headroom value maintained for the mobile station indicates that the mobile station has sufficient transmit power headroom to support a contemplated higher rate.



29. The base station of claim 22, wherein the headroom tracking circuit tracks changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station by incrementally adjusting the headroom value for the mobile station based on reverse link power control commands transmitted to the mobile station.

30. The base station of claim 22, wherein the headroom tracking circuit tracks changes in transmit power headroom between each full report using reverse link power control information associated with the mobile station by receiving one or more differential reports from the mobile station between the full reports, wherein the differential reports indicate incremental adjustments in transmit power being made by the mobile station responsive to reverse link power control commands received by the mobile station.

31. The base station of claim 30, wherein the headroom tracking circuit is configured to maintain headroom values for the plurality of mobile stations responsive to receiving full and differential reports from each mobile station.

32. The base station of claim 31, wherein the base station is configured to use the headroom values maintained for the plurality of mobile stations to determine whether particular ones of the mobile stations are candidates for reverse link rate increases.